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meeting of interested citizens of San Diego and vicinity September 27, 1903.

The by-laws as adopted designate the purposes of the organization and in part are as follows:

"The organization shall be called the Marine Biological Association of San Diego, for the purpose of securing the foundation and endowment of a scientific institution to be known as the 'San Diego Marine Biological Institution.'

"The general purposes of the institution shall be to carry on a biological and hydrographic survey of the waters of the Pacific ocean adjacent to the coast of South California, to build and maintain a public aquarium and museum and to prosecute such other kindred undertakings as the board of trustees may from time to time deem it wise to enter upon.

"The founding of the institution having been perfected and its endowment secured, the whole or such part thereof as may in the judgment of the trustees seem best shall, under such conditions as the trustees may impose, be transferred to the regents of the University of California, to become a department of the university coordinate with its already existing departments.

"The officers of the association shall be a president, vice-president, scientific director, secretary and treasurer. In addition there shall be a board of trustees consisting of seven members, three of whom shall be the president, vice-president and scientific director."

Officers were elected as follows:

President—Homer H. Peters.

Vice-President—Miss Ellen Scripps.

Scientific Director—Professor W. E. Ritter.

Secretary—Dr. Fred Baker.

Treasurer—Julius Wangenheim.

Additional Directors—E. W. Scripps and James MacMullen.

At a winter meeting of the board of trustees funds were guaranteed for three years which will enable the station to continue its work and expand it somewhat, perhaps to the extent of keeping the station in partial operation throughout the year in charge of a resident naturalist or fellow during the interim

between the summer and winter operations. A public spirited patron of the laboratory has offered to grant the laboratory the use of a nineteen ton schooner, the *Loma*, former pilot boat of the port, equipped with power, for purposes of collecting, sounding, dredging, etc., and also to erect a temporary building for accommodation of the laboratory which may be located at La Jolla, fifteen miles from San Diego on the ocean front. The permanent location of the buildings will not be determined until a thorough exploration of several possible situations shall have been made.

CHARLES ATWOOD KOFOID.

THE NECESSITY FOR REFORM IN THE NOMENCLATURE OF THE FUNGI.*

THE nomenclature question is almost entirely one of expediency. If the prevailing custom in making plant names has led to the establishment of a nomenclature that satisfactorily fills the requirements for accuracy and stability, and if it points out unflinchingly the proper procedure where our increased knowledge of any given group of plants necessitates the modification of our ideas of generic limits, then any change in traditional methods, or any attempt to substitute other generic names for those now commonly used, would be a folly so great as to approach lunacy. Let us see what the facts are as regards the fungi. Fries, in his classical work 'Systema Mycologicum,' the final volume of which was published in 1829, recognized 243 genera of fungi. In the 'Sylloge Fungorum' of Saccardo, the eight original volumes completed in 1889 contain 1,685 genera and 31,927 species. Supplementary volumes have appeared from time to time, the last in 1902, bringing the total number of recognized genera up to 2,348 and the species to almost 50,000. The treatment of the fungi by Schroeter, Lindau, Hennings Dietel and Fischer in Engler & Prantl's 'Pflanzenfamilien' was completed in 1900. The usage here differs radically from that of Saccardo in many respects and the number of genera accepted is only 1,811, or 537 less than are recognized by Saccardo. A

* Read before the Botanical Section of the American Association at the St. Louis meeting.

comparison of the generic treatment in the two works has not been attempted for all the groups. The following, however, will show that this difference in numbers is not a mere multiplication of genera by Saccardo. Of the 54 genera of the Agaricaceæ given by Hennings in Engler and Prantl, 15, or nearly 28 per cent., are not recognized by Saccardo, many of them not appearing even as synonyms, though his work is two years the later. If we reverse the comparison, the showing for uniformity in modern usage is much worse, since of the 82 genera given by Saccardo only 41, or exactly 50 per cent., are recognized in Engler and Prantl. This is certainly a case where it will be difficult to say what is the 'prevailing usage.' Taking the Hymenomycetes as a whole, Engler and Prantl give 147 genera, 25 of which, or 17 per cent., are not recognized by Saccardo. If these glaring differences cause us to investigate as to which of these works is based on the more logical and consistent usage, and, therefore, which is the safer nomenclatorial guide, we are forced to the conclusion that neither of them follows any recognizable or consistent rule of nomenclature. The case of each genus seems to have been settled on an independent basis and according to the whim of the moment. Doubtless the claim would be made for each work that the names were selected on the basis of priority, but priority has been flagrantly and repeatedly violated in both of them.

Again is the 'prevailing usage' furnishing us at the present time with a safe rule for the establishment of new genera on a sure and stable basis? That this is no idle question is shown by the vast increase of over 2,000 genera since 1829 and of 663 since 1889, if we count on the basis of the 'Sylloge,' and the tendency is for the still more rapid multiplication of genera in the near future. Every revision of a large genus in these days results in breaking it up into smaller generic groups. It is vitally important that this shall be done on some basis that will prove stable. What is really being done is illustrated by a recent revision of *Ravenelia*. After an exhaustive and critical study of the species the author very properly decides to break up the

genus. He leaves the majority of the species under the old generic name and proposes new names for the smaller segregations. Now it happens that *Ravenelia* was founded on a single species, *R. glandulosa*. In the proposed revision this species falls in one of the smaller groups and is no longer called a *Ravenelia*, while that name is applied to a group of species none of which were included under it by the author of the genus. If priority is to be more than an empty name such practices can certainly not be allowed to stand unchallenged, yet the author could point to hundreds and hundreds of precedents to justify his usage. In fact, we must admit that this usage has been the prevailing one ever since the time of Linnæus. The chaotic condition that must inevitably be produced by following this so-called 'method of residues' is well illustrated by the following figures taken from my work as a member of the nomenclatorial committee in finding the types of the older genera of fungi. I have listed 485 names that were proposed between 1753, the first edition of Linnæus's 'Species Plantarum,' and 1821, including the first volume of Fries's 'Systema Mycologicum.' Of these, 242, or one half, are to be rejected for various reasons. Some are hyponyms, never having been associated with a recognizable binomial species; some are typonyms, being based on species already used as the types of other genera; some were only proposed as subgenera, and some were based on sterile mycelia, monstrosities, insect work or plants that are not fungi. The remaining 243 names are available for use at the present time. The types of these have been determined according to the code proposed at the Washington meeting. One hundred of them, or 41 per cent., were monotypic, being based on a single species. In 135 of them, or 55 per cent., the type was determined by page priority. Nine are historic types taken from pre-Linnæan authors and 4 were inferred from the form of the specific name. Of these 243 available names, 118 are used by Saccardo in their proper historic sense, being still associated with their original type species. In the other 125 cases the names are either not

given by Saccardo or they have been shifted from their proper historic use and do not now contain their original types. Of course, in some cases this is correct, since the list includes some metonyms where the type falls within the limits of an earlier valid genus. The number of these has not been determined, since it will depend on the conception of generic limits and will necessarily change from time to time with the increase of our knowledge. As genera are now recognized it probably does not exceed 20 per cent. This would leave an estimated 218 valid genera to 100 of which, or 45 per cent., the oldest available name is not applied by Saccardo. Of the 100 monotypes 58 appear in Saccardo under their original name, while 42 must be sought under other genera. In one case noted, five genera have at different times been founded on the same type species, and three of these names are still doing duty in both Saccardo and Engler and Prantl.

Glaring inconsistencies like those might be cited almost endlessly. The above, however, is sufficient to show conclusively first, that we have at present no widely accepted 'prevailing usage' in regard to the names of fungus genera; and secondly, that the usage that has prevailed in the formation of generic names has not led to stability or to the establishment of any logical system of procedure. In fact, the existing condition is so confused and anomalous as to imperatively demand an immediate and sweeping reform. Doubtless all will now agree that any rational system of nomenclature must be based strictly on priority. This in itself is a long step in advance, for only a generation ago the foremost systematists laid less stress on priority than on the supposed appropriateness of a name. The unfortunate result of their practices has just been passed in review. While all will agree on the basic principle of priority there will be divergence of opinion when the attempt is made to formulate a code of rules for applying it. The ideas and methods of the earlier writers were so diverse from our own that it is impossible to bring their work into harmony with ours without adopting rules and methods that are necessarily more

or less arbitrary. It is perfectly clear that they had no idea of the type of a genus or a species in the sense in which we use the word to-day. Their 'type,' in so far as they had one, was a mental concept; and yet if we are to prevent this endless shifting of generic names from one group of plants to another, it becomes necessary to tie down these ancient concepts to the material basis of a single species. The exact way in which this is to be done really matters very little. No rule or system of rules can possibly be devised which, if consistently followed, will not throw out or change the meaning of many of the names accepted by modern writers. Any attempt at reform based on a method devised for the purpose of 'saving names' can only end by adding to the existing confusion. Let us then nerve our minds to the point of seeing not only any, but, if necessary, all of our most favored names sacrificed to consistency, and unite in adopting the simplest and most direct code of rules that can be agreed upon. When this is once done and its provisions are carried out in good faith we shall by the one cataclysmic effort have placed the nomenclature of our science on so firm and stable a basis that we need no longer dread the appearance of each succeeding contribution to mycological knowledge on account of the changes in names that have been so constant and so annoying an accompaniment of each forward step in the past.

F. S. EARLE.

NEW YORK BOTANICAL GARDEN.

ENERGETICS AND MECHANICS.

WITHIN the past ten years energetics has been brought to the front as furnishing a systematic account of phenomena that are connected most directly with quantitative relations of energy, and of its transformations. To any one who has stood aloof from the polemic between the 'energetic' and the 'forceive' view, it must seem proved that the former has rendered a permanent service to physics, by devising and putting into circulation forms of statement that are freed from superfluous hypothetical assumptions, and brought closer to the foundations of natural science in ascertained facts. For example, the